


PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference Cal 89031		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/EP2004/014578		International filing date (day/month/year) 20.12.2004		Priority date (day/month/year) 19.12.2003
International Patent Classification (IPC) or national classification and IPC B62K5/08, B62D9/02				
Applicant PIAGGIO & C. S.P.A.et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 7 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 18.07.2005		Date of completion of this report 06.12.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Grunfeld, M Telephone No. +31 70 340-2216		



Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-17 as originally filed

Claims, Numbers

1-26 received on 01.08.2005 with letter of 29.07.2005

Drawings, Sheets

1/8-8/8 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/014578

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	4,7-15,17,18,20-26
	No: Claims	1-3,5,6,16,19
Inventive step (IS)	Yes: Claims	10-15
	No: Claims	1-9,16-26
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Further to the applicants letter of July 29 2005:

- 1 Reference is made to the following documents:
D1: GB-A-2 279 047 (DAVID DOVISON) 21 December 1994 (1994-12-21)
D2: DE 201 01 192 U1 (SHAW, ANTHONY) 10 May 2001 (2001-05-10)
D3: US-A-4 180 280 (DOVERI, CARLO) 25 December 1979 (1979-12-25)
- 2 Document D1 in figure 32 (a) does show an embodiment of a front suspension group with two shock absorbers/suspension elements (indicated by numeral 17 in the figure) which are arranged essentially vertically connecting the cross members so as to form an articulated quadrilateral, and discloses all the features of newly filed claim 1 (or originally filed claims 1,2,3) and new claim 6.
- 3 Regarding the applicants comments about the arrangement of the wheels, the applicants attention is drawn to D1 page 3 paragraph 4 in which it is stated that preferably the paired wheels are disposed about the body with lateral and longitudinal symmetry!
- 4 Document D1 also discloses all the features of newly filed claims 2,3 and 5 as follows:
Fig 32 (a) shows a lower cross member made in two elements (new claim 2).
Single component horizontal cross members are disclosed in claim 3 of D1 (new claim 3).
Arch shaped vertical wheel suspension elements are shown in fig 3 of D1 (new claim 5).
- 5 Therefore, the application does not meet the criteria of Article 33(1) PCT, because the subject-matter of new claims 1-3, 5 and 6 is not new in the sense of Article 33(2) PCT.
- 6 Dependent claims 4,7-9 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:
D2 discloses suspensions connected to the hubs (new claim 4).

D3 discloses a vertical suspension element with pivoting hub connecting rod (claims 7-9).

It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply any of these features with corresponding effect to a vehicle according to document D1, thereby arriving at a vehicle according to claims 4,7-9.

- 7 It would seem that the combination of the features of dependent claims 10-15 is neither known from, nor rendered obvious by, the available prior art.

However, the applicants attention is drawn again to paragraph 4 of the written opinion (dated 3 March 2005).

CLAIMS

1. Four-wheeled vehicle (1) with two steered front wheels (2, 3) comprising a frame (13), handlebars (16), two rear wheels (4, 5) and a front suspension group (6) that acts upon said two front wheels (2, 3) characterised in that said front suspension group allows the rolling of the vehicle, ~~x~~ and

~~1. Four-wheeled vehicle (1) according to claim 1, characterised in that said front suspension group (6) comprises at least two shock absorbers (22), at least two horizontal cross members (7,8), connected through at least two hinges (9,9',10,10') to said frame (13) and at least two vertical suspension elements (11,12) firmly connected to said two cross members (7,8) so as to form an articulated quadrilateral for the rolling of the vehicle (1), ~~x~~ and~~

~~1. Four-wheeled vehicle (1) according to any one of the previous claims, characterised in that said horizontal cross members (7,8) are connected at its ends to said vertical suspension elements (11,12) through hinge elements (57).~~

2. Four-wheeled vehicle (1) according to any one of the previous claims, characterised in that at least one

of said horizontal cross members (7,8,8') is made in two elements (8,8') connected to said frame (13).

3 ~~8~~. Four-wheeled vehicle (1) according to any one of the previous claims, characterised in that each of said
5 horizontal cross members (7,8,8') is made in a single component.

4 ~~6~~. Four-wheeled vehicle (1) according to any one of the previous claims, characterised in that said suspensions (11,12) are connected to the hubs (21) of
10 said front wheels (2,3) and each comprise a shock absorber (22).

5 ~~7~~. Four-wheeled vehicle (1) according to claim ¹~~4~~ or ~~3~~, characterised in that each of said vertical suspension elements (11,12) has an arched shape
15 suitable for at least partially surrounding said front wheel (2 or 3) to reduce the transversal bulk of said vehicle (1).

6 ~~8~~. Four-wheeled vehicle (1) according to claim ⁵~~7~~, characterised in that said lower cross member (8)
20 comprises two half-arms (8',8''), each half-arm (8',8'') extending from said central hinge (10',10') to said end hinge (57).

7
8. Four-wheeled vehicle (1) according to any one of
claims ~~7~~⁵ or ~~8~~⁶, characterised in that each vertical
suspension element (11,12) comprises at least one
connecting rod (54) for connection with the hub of the
5 front wheel; each of said connecting rods (54)
comprising at least one cylindrical hinge (55,56) at
its ends.

8 9. Four-wheeled vehicle (1) according to claim ~~8~~⁷,
characterised in that each shock absorber (22) works
10 between a said vertical suspension element (11,12) and
a said connecting rod (54).

8
9 10. Four-wheeled vehicle (1) according to claim ~~10~~⁸,
characterised in that each end hinge (57) of a said
half-arm (8'8") of the lower cross member (8) is
15 directly integral with said connecting rod (54).

6
10 11. Four-wheeled vehicle (1) according to claim ~~8~~⁶,
characterised in that said front suspension group (6)
also comprises at least one upper connecting rod (60)
to connect said upper cross member (7) to each vertical
20 suspension element (11,12).

10
11 12. Four-wheeled vehicle (1) according to claim ~~12~~¹⁰,
characterised in that said front suspension group (6)
also comprises at least one cylindrical hinge (61) to

connect said connecting rods (60) to said upper cross member (7) and at least one ball joint (62) to connect said connecting rod (60) to said vertical suspension element (11,12).

5 ¹¹~~12~~ 14. Four-wheeled vehicle (1) according to claim ~~12~~, characterised in that each shock absorber (22) is connected to said lower half-arm (8' or 8'') through a hinge element (63) and to the upper cross member (7) through said hinge (61).

10 ¹⁰~~13~~ 15. Four-wheeled vehicle (1) according to claim ~~12~~, characterised in that said front suspension group (6) also comprises at least one cylindrical hinge (64) to connect said connecting rod (60) to said upper cross member (7) and at least one ball joint (65) to connect
15 said connecting rod (60) to said vertical suspension element (11,12).

¹³~~14~~ 16. Four-wheeled vehicle (1) according to claim ~~15~~, characterised in that said front suspension group (6) also comprises at least one cylindrical hinge (66) to
20 connect said connecting rods (60) to said shock absorber (22).

¹⁴~~15~~ 17. Four-wheeled vehicle (1) according to claim ~~16~~, characterised in that said shock absorber (22) is also

connected to said middle of the upper cross member (7) through said hinge (9).

5 ⁵
~~16~~ ¹⁶ ~~18~~. Four-wheeled vehicle (1) according to claim ~~7~~, characterised in that each lower cross member (8) and upper cross member (7) comprises two half-arms (7', 7'', 8', 8''), each half-arm (7', 7'', 8', 8'') extending from said central hinge (9', 9'', 10', 10'') to an end hinge (57).

¹⁶
~~17~~ ¹⁶ ~~19~~. Four-wheeled vehicle (1) according to claim ~~18~~, characterised in that said front suspension group comprises an oscillating plate (70) rotatably hinged, through at least one cylindrical hinge (71) to said frame (13).

¹⁶
~~18~~ ¹⁶ ~~20~~. Four-wheeled vehicle (1) according to claim ~~18~~ or 19, characterised in that each shock absorber (22) is connected to said oscillating plate (70), through a hinge element (73), and to said vertical suspension element (11 or 12) through said ball joint (57).

¹⁶
~~19~~ ¹⁶ ~~21~~. Four-wheeled vehicle (1) according to any one of the previous claims, characterised in that it also comprises a rear suspension group (14), a traction transmission system (15) and a coupling system between said frame (13) and an engine unit (35) to dampen the

vibrations between said engine unit (35) and said frame (13).

20 ~~22~~¹⁹. Four-wheeled vehicle (1) according to claim ~~21~~, characterised in that said coupling system between said frame (13) and said engine unit (35) comprises at least one front connection group and at least two rear connection groups (23); said two rear connection groups (23) being arranged laterally on opposite sides of said engine unit (35) so as to couple with said frame (13) to allow exclusively movements of said engine unit (35) substantially in the vertical plane of the vehicle (1).

21 ~~23~~²⁰. Four-wheeled vehicle (1) according to claim ~~22~~, characterised in that said two rear connection groups (23) are arranged laterally on opposite sides of said engine unit (35) at the drive shaft (24).

22 ~~24~~²¹. Four-wheeled vehicle (1) according to claim ~~23~~, characterised in that each said rear connection group (23) comprises at least one roller device.

23 ~~25~~²². Four-wheeled vehicle (1) according to claim ~~24~~, characterised in that each rear connection group (23) comprises at least one silentblock.

24 ~~26~~²³. Four-wheeled vehicle (1) according to claim ~~25~~, characterised in that each said rear connection group

(23) comprises at least one roller device and at least one silentblock coupled together.

93 27. Four-wheeled vehicle (1) according to any one of claims 21 to 25, characterised in that said traction
5 transmission system (15) comprises a first sprocket (33), a first drive chain and/or belt (27) acting between the drive shaft (24) of said engine unit (35) and a differential (28) and second sprockets (29) and second drive chains and/or belts (30), acting between
10 said differential (28) and the rear wheels (3, 4) of said vehicle (100).

96 28. Four-wheeled vehicle (1) according to any one of the previous claims 21 to 26, characterised in that said rear suspension group (14) comprises two
15 suspensions (31, 32) with independent longitudinal arms.